

**Test Plan 05-74**

**Metal Parts Furnace**

# **HD Trial Burn**

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**5 February 2004  
Deseret Chemical Depot  
Stockton, Utah 84071**

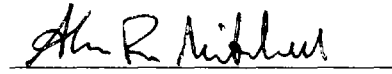
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HD Trial Burn**

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**Table of Contents**

	<u>Page No.</u>
<b>Point of Contact .....</b>	<b>iii</b>
<b>Section I. Introduction.....</b>	<b>1</b>
1. Background .....	1
2. Methodology.....	2
3. Objectives .....	2
4. Schedule .....	3
5. References.....	3
<b>Section II. Safety.....</b>	<b>3</b>
1. General Safety Precautions .....	3
2. Specific Safety Precautions.....	4
<b>Section III. Test Procedures.....</b>	<b>5</b>
1. Introduction .....	5
2. Preparation .....	5
3. Procedures.....	6
4. Data Collection.....	8
5. Changes.....	10
6. Disposition.....	11
<b>Appendix A. Personnel Responsibilities .....</b>	<b>A</b>
<b>Appendix B. Level III Test Schedule .....</b>	<b>B</b>
<b>Appendix C. Tables .....</b>	<b>C</b>
<b>Appendix D. Emission Requirements .....</b>	<b>D</b>
<b>Appendix E. Process Parameters .....</b>	<b>E</b>
<b>Appendix F. Drawings .....</b>	<b>F</b>
<b>Appendix G. Calculations .....</b>	<b>G</b>

**Metal Parts Furnace  
HD Trial Burn**

Test Plan 05-74

**Table of Contents (Continued)**

	<u>Page No.</u>
<b>Appendix H. Equipment Description.....</b>	<b>H</b>
<b>Appendix I. Material Safety Data Sheet.....</b>	<b>I</b>
<b>Appendix J. Quality Assurance Project Plan .....</b>	<b>J</b>
<b>Appendix K. Standard Sampling Operating Procedures.....</b>	<b>K</b>
<b>Appendix L. Metal Parts Furnace Shakedown and Testing for HD Trial Burn .....</b>	<b>L</b>
<b>Appendix M. Review Team Checklist.....</b>	<b>M</b>
<b>Appendix N. Metal Part Furnace Standard Operating Procedures.....</b>	<b>N</b>
<b>Appendix O. Data Collection Sheets And Forms .....</b>	<b>O</b>
<b>Appendix P. References.....</b>	<b>P</b>
<b>Appendix Q. Glossary .....</b>	<b>Q</b>

## **Metal Parts Furnace HD Trial Burn**

Test Plan 05-74

### **Section I. Introduction**

#### **1. Background.**

a. The Chemical Agent Munitions Disposal System (CAMDS Site) operates a Hazardous Waste (HW) Test and Disposal Facility at Deseret Chemical Depot (DCD) located in Stockton, Utah. The Facility operates under a Resource Conservation and Recovery Act (RCRA) Part B Permit, Environmental Protection Agency (EPA) Identification Number (No.) UT5210090002, issued by the Utah Department of Environmental Quality (DEQ), Utah Division of Solid and Hazardous Waste (DSHW), and a Title V Permit issued by the Utah DEQ, Division of Air Quality (DAQ). The CAMDS Site mission is to develop and test demilitarization processes or equipment for the destruction of chemical agent-filled munitions and bulk storage containers.

b. The Metal Parts Furnace (MPF) is one of the furnaces at the CAMDS Site. The MPF is designed to thermally treat chemical agent contaminated non-explosive munition bodies, munition components, bulk containers, and miscellaneous solid and liquid materials.

c. The Mustard (HD) [bis(2-chloroethyl) sulfide] Trial Burn will verify that the chemical agent HD heels can be treated in the MPF without exceeding regulatory parameters or MPF capacity limits. An agent heel is the volume of agent remaining in a munition or container after most of the agent has been removed.

d. Previous testing of the MPF successfully demonstrated that both chemical nerve agents GB [Isopropylmethylphosphonofluoridate (Sarin)] and VX [O-ethyl-S-(2-diisopropyl-aminoethyl) methylphosphonothiolate] can be thermally destroyed within regulatory parameters established by the State of Utah. The MPF can treat up to 130 pounds (lbs) of chemical nerve agent GB and up to 45 lbs of chemical nerve agent VX per furnace charge. The RCRA Permit includes a conditional limit that allows 130 lbs HD per charge to be treated in the MPF, if demonstrated in a trial burn or performance test.

e. The Miscellaneous Waste Trial Burn (Test Plan 05-73) is expected to establish a maximum permitted liquid feed rate of 109 lbs per charge. We propose this Trial Burn will demonstrate a maximum liquid HD feed rate of 109 lbs per furnace charge.

f. This Trial Burn Test Plan is organized as a stand-alone document. It provides a detailed description of the Trial Burn and is designed to meet the requirements of 40 CFR and the RCRA Part B Permit.

## **2. Methodology.**

a. The Trial Burn will demonstrate compliance with the RCRA performance standards for treatment of HD in the MPF. The performance standard for Destruction and Removal Efficiency (DRE) of HD is 99.99 percent (%). It is not the objective of the HD Trial Burn to demonstrate MACT emission standards (40 CFR 63.1200 Subpart EEE) .

b. The Trial Burn will also show that the feed rates of metals present in HD do not exceed the Health Risk Assessment (HRA) metals limits.

c. The MPF will be operated in accordance with (IAW) the permit limits demonstrated during the Miscellaneous Waste Trial Burn (Test Plan 05-73). These permit limits include liquid feed limits, HRA metals feed limits, and the incinerator and Pollution Abatement System (PAS) system parameters. Establishing new incineration and PAS parameters is not an objective of this Trial Burn.

d. The Shakedown (Appendix L) will be conducted prior to the Trial Burn and will establish the feed rate to be used during the Trial Burn based upon the quantity of chemical agent HD that can be processed in 120 minutes. The tests will be performed with empty pre-punched TCs filled with chemical agent HD with amounts increased incrementally from 58 lbs in 17-lb increments (Table C-4, Appendix C) to determine a maximum load based on the temperature response of the MPF.

## **3. Objectives.**

a. In the Shakedown, provide data to be used to establish the maximum chemical agent HD load in TCs processed through the MPF within the temperature range of the MPF.

b. Provide data to be used to demonstrate compliance with the RCRA performance standards for incineration of chemical agent HD in the MPF.

c. Control emissions of chemical agent HD from the MPF to less than 0.03 milligrams per cubic meter (mg/m<sup>3</sup>).

d. Generate metals emission data for evaluation of the Health Risk Assessment for DCD.

## **4. Schedule.**

a. The HD Trial Burn will begin after the CAMDS Site has successfully completed a startup and Shakedown for the MPF, described in Appendix L.

b. The Level III Schedule for the Trial Burn is provided in Figure B-1 (Appendix B). The Trial Burn period, including Shakedown, is estimated to last three weeks. Trial Burn Runs will be made daily, or on alternate days if feasible. A daily schedule for test operations and sampling is provided in Appendix B. No testing will be started after 2:00 pm on any day.

c. The HD Trial Burn will consist of one Baseline Run and three Trial Burn Runs. Each Trial Burn Run will have a minimum actual sampling time of six hours. If the Trial Burn Run is interrupted for any reason, additional time will be added to the Trial Burn Run to compensate for the down time. Total Trial Burn Run time may exceed nine hours to complete processing all the feed materials.

d. Test data for each Trial Burn Run will be reviewed with Utah DSHW and Site personnel during a meeting held the day following each Trial Burn Run. This meeting will be used to resolve any issues and to prepare for the next Trial Burn Run.

e. The Utah DSHW and DAQ will be notified in writing 60 days prior to the start date of the Trial Burn.

**5. References.** References are provided in Appendix P.

## **Section II. Safety**

### **1. General Safety Precautions.**

a. The HD Trial Burn will be conducted IAW the State of Utah regulatory requirements (CAMDS Part B Permit), 40 CFR, this Plan, approved Standing Operating Procedures (SOPs), and related safety and operational procedures. The Trial Burn will be stopped if unsafe conditions relating to equipment or procedures are discovered.

b. All required personnel training and orientation will be completed before the start of the Trial Burn. All CAMDS personnel involved in the Trial Burn will have completed the training requirements listed in the RCRA Part B permit, Attachment 7. Any outside contractors, such as the stack-sampling contractors, will be required to have the minimum hours of HAZWOPER training and a government security clearance, or be escorted by a CAMDS official who has the required training and clearance.

c. All required safety, environmental, and regulatory approvals and permits will be obtained prior to the start of the Trial Burn. Such approvals and permits are listed in Section III, 2. g, page 13 of the Part B Permit.

d. Risk Management will check all certifications (laboratory equipment, calibrated equipment, etc.) prior to and during testing. The requirements for the MPF and PAS instrumentation are listed in the Site Plan 05-01 *MPF Continuous Monitoring System Performance Evaluation Test Plan* (References, Appendix P). Note that Site Plan 05-01 requirements are not generally applicable to this Trial Burn. The requirements for laboratory equipment are provided in the QA Project Plan (Appendix J) and The Sampling Standard Operating Procedure (Appendix K).

e. All tasks and safety controls relating to facilities, operation, equipment, ventilation, monitoring, and personal protective equipment will be followed IAW SOPs.

f. Personnel will obey all safety regulations. Stack sampling and regulatory personnel will be escorted by qualified personnel, who will ensure all relevant safety procedures and methods are followed. Personnel will follow all applicable federal safety requirements (29 CFR 1910) for hot work, fall protection, confined space, etc. Personnel will also follow Army and DCD requirements for Personal Protective Equipment (PPE).

g. If MPF limits are exceeded, or unstable conditions develop (i.e. MPF does not respond properly to controls), the Trial Burn Run will be interrupted and corrective action taken by test personnel.

h. If a Shakedown or Trial Burn Run is not started by 2:00 pm on a given day, it will be discontinued.

## **2. Specific Safety Precautions.**

a. Prior to Shakedown or Trial Burn Run, and not less than once per week during operation, all Automatic Waste Feed Cutoff (AWFCO) interlocks and associated alarms will be tested to verify operational capability. This is accomplished by either lowering or raising the alarm point above or below the operational value, which causes the alarm to activate.

(1) The MPF AWFCO System will be tested every seven days.

(2) Results of this Test will be recorded in the Control Module Operator (CMO) MPF Logbook. Table C-3 (Appendix C) provides the interlock setpoints. Weekly data will be recorded on the Weekly Waste Feed Cutoff Interlock List (Table E-1, pages E-4 to E-8).

(3) The Utah DSHW will be notified seven days prior to the initial interlock test, and allowed to witness the testing.

b. Personnel handling chemical agent HD will follow all applicable safety regulations including Program Manager for Chemical Demilitarization (PMCD) Regulation (R)-385-1, *PMCD Safety Program*, Army (AR) 385-61, *Army Chemical Agent Safety Program*, Department of the Army Pamphlet (DA PAM) 385-61, *Toxic Chemical Agent Safety Standards*, and IM 385-49-01, *Chemical Agent Munitions Disposal System Safety Manual* (References, Appendix P).

c. The AWFCO parameters are provided in Table C-3 (Appendix C). All parameters will be continuously monitored during the Trial Burn. If the System should exceed any of the cutoff setpoints during operation, the AWFCO System and/or the Operator will shut off test feed to the MPF. A description of the AWFCO System is provided in Appendix H. All AWFCO parameters have pre-alarm capability. When an AWFCO parameter reaches 80% of the limit value, the CMO computer screen displays the values with a yellow background.

d. In the event of a major equipment or System failure, it may be necessary to shut down the MPF completely. A shutdown of this type will be performed IAW Appendix N, the MPF Standing Operating Procedures, and SOPs OPN 05-00-01-01, *Metal Parts Furnace and Scrubber System*, and OPN 35-00-05-02, *Operation of the Metal Parts Furnace* (Appendix Q).

e. Chemical agent feed to the MPF will be stopped if one or more of the following occur:

(1) Monitors for the Combustion Chamber temperature, gas flow, or CEMS, do not operate properly or data are not being recorded.

(2) Loss of flame for either the Primary Combustion Chamber (PCC) or the Secondary Combustion Chamber (SCC) burners.

(3) Waste feed cut-off setpoints are exceeded.

f. Corrective action will be taken before feed is restored.

### **Section III Test Procedures.**

#### **1. Introduction.**

a. The HD Trail Burn will provide temperature profiles for processing TCs with chemical agent HD heels in sequence. HD load will be determined during the Shakedown (Appendix L).

#### **2. Preparation.**

a. The HD Trial Burn is planned to start after completion of Shakedown

- b. All testing will be IAW applicable SOPs (Appendix N), Quality Assurance Project Plan (QAPP), provided in Appendix J, the Standard Sampling Operating Procedure (SSOP), provided in Appendix K, and this Plan.
- c. Instruments will measure temperature, pressure, flow and gas readings according to Table C-1 (Appendix C).
- d. Testing will occur in the MPF, Multipurpose Demilitarization Facility (MDF), and Bulk Item Facility. PCC, SCC, and PAS descriptions are provided in the Equipment Description (Appendix H).
- e. Certifications.
- (1) The Continuous Emission Monitoring System (CEMS) will undergo routine inspection, and calibration prior to the Trial Burn testing.
  - (2) The Ventilation System will have been balanced and verified prior to Shakedown. A description of the ventilation system balancing is provided in Appendix H.
  - (3) All devices that measure operating parameters will be calibrated and verified prior to Shakedown. Procedures and details of the calibrations are provided in Site Plan 05-01. Calibration checks will be performed after the testing is complete to verify that accurate measurements were obtained. Details of the calibration results will be provided in the final Trial Burn Report.
- f. Required Approvals and Permits: include the following:
- (1) Safety Operational Readiness Reviews
  - (2) Approved Trial Burn Plan
  - (3) Clean Air Act (CAA) Title V Permit
  - (4) RCRA Part B Permit

### **3. Procedures.**

- a. Baseline Run.
- (1) Prior to introducing any hazardous material feed to the MPF, a Baseline Run will be performed.
  - (2) The Baseline Run will collect data on the MPF System to represent the background reading for all sampling and data parameters without incinerating agent HD.

(3) This Baseline Run is used to demonstrate that the MPF System and all personnel involved are prepared to perform a Trial Burn.

b. The MPF System will be brought up to full operating conditions before introducing agent HD into Zone 1 of the PCC. The phrase "full operating conditions" means that temperatures are above the minimum for feeding waste, the System is under the required negative pressure, and that the System is in compliance with all other regulatory limits.

c. The startup operational sequence will be: the PAS, followed by the SCC, then the PCC.

d. A summary of the MPF startup procedures is provided in Appendix N.

e. The procedures for each of the three trial runs of this Trial Burn are as follows:

(1) The number of TCs, as well as the timing of the Trial Burn runs, will be adjusted to meet stack gas sampling requirements.

(2) Test Items and Systems Components.

(a) An adequate amount of HD agent will be requested from storage. All chemical agent HD TCs will be received at the MPF and weighed IAW SOP OPN 22-07-99-01, *Weighing TCs*, and transported to the MDF/BIF IAW SOP OPN 95-07-07-01, *Processing TCs*.

(b) A minimum of seven empty pre-punched TCs will be available prior to testing. Each Trial Burn run requires a minimum of seven empty pre-punched TCs. All filling operations will be performed in the MDF and the BIF. The TCs will be charged with chemical agent HD to the required heel amount from a pre-weighed chemical agent filled TC IAW SOP OPN 17-27-01-01, *Transferring Chemical Agent from Agent TC to Punched TC*. The procedures for processing chemical agent HD TCs are:

1 A pre-punched TC will be staged in the MDF Toxic Unpack Area.

2 The determined amount of chemical agent HD will be drained from a pre-weighed chemical agent HD TC into pre-punched TCs IAW SOP OPN 17-27-01-01, *Transferring Chemical Agent From Agent TC to Punched TC*.

3 The pre-punched TCs will be sequenced through the MPF in accordance with (IAW) Table C-9 and SOP OPN 05-00-01-09, *MPF Charge Car Operation*.

1                   4 Each processed pre-punched TC will be moved into a cooling bay IAW  
2                   SOP OPN 05-00-01-10, *MPF Discharge Car Operation*.

3  
4                   5 When a pre-punched TC cools to 120° F or less, the TC will be  
5                   vacuumed and the residue will be collected and managed as HW IAW the  
6                   RCRA Part B Permit.

7  
8                   d. Waste Constituents.

9  
10                  (1) The wastes resulting from this Trial Burn will consist of small amounts of ash  
11                  and solid residue from the TCs.

12  
13                  (2) This waste, in the form of a fine ash, will be removed and managed as HW.

14  
15                  e. Combustion Temperature Ranges

16  
17                  (1) Temperatures between 1,100° F to 1,300° F (depending upon the waste  
18                  being processed) are maintained in the PCC.

19  
20                  (2) The SCC is maintained between 1,600° F and 1,650° F.

21  
22                  f. Waste Feed Rates

23  
24                  (1) Each Trial Burn Run will consist of chemical agent-added, pre-punched TCs  
25                  staged in sequence at the MPF System in approximately 80-minute intervals  
26                  (Table C-9). The 80-minute staging interval will give the TC in the MPF a total  
27                  residence time of 120 minutes. This will allow sufficient time for the chemical  
28                  agent heel to be incinerated before the TC is removed from the MPF and will also  
29                  provide space in the MPF while the processed TC is being monitored, should a  
30                  chemical agent alarm require the TC to be returned to the MPF.

31  
32                  (2) Chemical agent HD will be introduced into the MPF as pounds of agent on a  
33                  planned time schedule (Table C-9). The MPF is expected to be in a test feed  
34                  mode for a sufficient time that will be adjusted to requirements of the analytical  
35                  contractor.

36  
37                  (3) Surplus feed materials (HD) not intended for any other tests may be  
38                  destroyed after completion of the Trial Burn. Rates will be limited to 50% of  
39                  those proved during the Trial Burn.

40  
41                  g. At the conclusion of each Trial Burn Run, the Test Review Team will review test  
42                  data for adequacy. The team will complete a Test Review Team Checklist upon  
43                  completion of the review. An example of the checklist is provided in Appendix M.

#### 4. Data Collection.

a. Manual sampling of stack gases, PAS Brine solution, and feed material ash will be performed during all Trial Burn Runs.

(1) A sampling contractor will provide the sampling and analytical services required for this Trial Burn and also provide the HD Trial Burn Report. The sampling and analytical activities and requirements are provided in the SSOP (Appendix K). Additional requirements are provided in the Quality Assurance Project Plan (QAPP), Appendix J. Tables C-7, and C-8 (Appendix C) detail the sampling requirements, and Drawing SK05-072 (Appendix F) indicates the sample locations.

(2) The DSHW will be notified prior to all sampling events.

b. If the MPF operation is interrupted more than three times during any one Stack Sampling Train, the sample must be rejected.

(1) All Sample Trains for each Trial Burn Run must be accepted for the Trial Burn Run to be accepted.

(2) Sampling will continue through operational interruptions if there is material in the MPF. Sampling will be stopped only if gas flow through the MPF System is interrupted, or if the next scheduled feed will be delayed more than 20 minutes.

(3) As soon as gas flow through the MPF is interrupted, sampling must stop. The probe may remain in the stack, and remain heated or cooled, as necessary. If a run is aborted, the probe must be removed.

(4) If sampling has been interrupted for 120 consecutive minutes, the Trial Burn Run will be aborted. The time will be calculated from the initial time sampling was stopped. If the Trial Burn Run is aborted, the samples may be deemed invalid (at the discretion of DSHW) and new samples will be taken during the next Trial Burn Run.

c. In addition to data collected by the Process Data Acquisition System, Process Data will be collected by the methods and in the frequencies provided on data collection sheets and forms (Appendix O).

d. pH readings will be taken manually from the Scrubber Sump and Clear Liquor loops of the PAS (Figure F-3, Appendix F).

e. The first Opacity Reading will be taken 15 minutes before each Trial Burn Run. Subsequent readings will be taken every 30 minutes. An Opacity Reading consists of a set of readings taken every 15 seconds for 6 minutes. Readings will be recorded on the Visible Emission Observation Form (Figure O-4, Appendix O). Readings must be taken by a State of Utah certified Opacity Reader.

f. Logbooks.

(1) The date, time, and duration of all AWFCO events, including the triggering parameters, reason for any deviation, and corrective measures taken to avoid recurrence, will be recorded in the CMO MPF Logbook. Corrective action must be taken prior to restarting MPF feed.

(2) All information pertaining to the function and operation of the MPF will be recorded in the CMO MPF Logbook.

(3) The Data Collection Representative will ensure that an entry is made for all information on Trial Burn events as they occur, i.e., start times, parameters, equipment failures, and interruptions.

(4) All monitoring and inspection data collected during this Trial Burn will be recorded in the MPF CMO Logbook.

g. Reports.

(1) The Stack Sampling Contractor will prepare the HD Trial Burn Report IAW all applicable regulatory and 40 CFR requirements.

(2) The CAMDS Site will submit a copy of the HD Trial Burn Report to the State of Utah DEQ, DSHW Executive Secretary within 90 calendar days following the Trial Burn. A Technical Report will be prepared which will detail the daily activities of the Trial Burn.

(3) The State of Utah DAQ will be given a courtesy copy of the report.

**5. Changes.**

a. The Test Review Team will recommend all changes. The PM will prepare the proper change documents. The PM, Project Coordinator, and Safety Representative will concur to written change documents. The Director of Engineering will approve the changes.

b. Copies of change documentation will be provided to the Environmental and Documentation Representatives and the Technical Writer. Changes will be listed on a "Change Summary" document and distributed.

1 c. If a test procedure requires modification to the RCRA Part B Permit, the Utah  
2 DSHW must grant approval and issue the modification before testing can proceed.  
3 CAMDS will comply with the requirements of 40 CFR 270.42 and State of Utah  
4 regulations at R-315-3-4 with regard to any required permit modifications.  
5

6 d. Following publication of this Trial Burn Plan, changes will be submitted on the  
7 AMSSB Form 1012, *Recommended Changes to Publications and Blank Forms*  
8 *(Other than SOPs)* (Figure O-7, Appendix O).  
9

## 10 **6. Disposition.**

11  
12 a. All HW generated during the HD Trial Burn and Shakedown will be tracked on the  
13 HW Tracking Form, AMSSB Form 6014, *Hazardous Waste Tracking Record*  
14 *(Figures O-5 and O-6, Appendix O)*.  
15

16 b. Records relating to HW and environmental regulations will be retained in the  
17 Operating Record.  
18

19 c. Disposition of HW will be coordinated by Risk Management.  
20

21 d. HW generated during the Trial Burn will be characterized and managed IAW the  
22 RCRA Part B Permit Waste Analysis Plan, and any applicable RCRA and State of  
23 Utah regulations.  
24  
25  
26